

CHEMICAL MECHANICAL PLANARIZATION
OF LOW DIELECTRIC CONSTANT MATERIALS

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ABSTRACT

The present invention relates to apparatus, procedures and compositions for avoiding and reducing damage to low dielectric constant materials and other soft materials, such as Cu and Al, used in fabricating semiconductor devices. Damage reduction can be achieved by decreasing the role of mechanical abrasion in the CMP of these materials and increasing the role of chemical polishing, which can also improve material removal rates. Increasing the role of chemical polishing can be accomplished by creating a polishing slurry, which contains components that interact chemically with the surface to be polished. This slurry may or may not also contain soft abrasive particles, which replace the hard abrasive particles of conventional slurries. Use of soft abrasive particles can reduce the role of mechanical abrasion in the CMP process. Use of this slurry in CMP can reduce surface scratches and device damage.

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